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ABSTRACT

Breaking with past conceptions of change as a pendulum swing based upon dichotomies, this paper offers a model which depicts change as sequential, emergent, and transformational. Patterns of change identified in the fields of technology and science are also identified in the field of education, and a three stage paradigm depicting transformational change in education is outlined under the headings of principles, practices, and outcomes. The staged progression described moves from teaching aids, to audiovisual techniques, to instructional technology. A bibliography is included. (FM)

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TRANSFORMATIONS IN SOCIETY AND EDUCATION

by

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TRANSFORMATIONS IN SOCIETY AND EDUCATION

There are no passengers on Spaceship Earth; everybody is crew.

- Marshall McLuhan

Believable? Possibly, but nevertheless difficult to comprehend. The statement assumes we can take a "cosmic" view of the earth and see mankind from a different perspective: a perspective from which the crises of inflation and recession, the problems of pollution, and education will be seen as a part of the evolutionary process - a perspective from which we can work towards long range planning and problem resolution.

A change in perspective of this magnitude involves what Kuhn (1962) refers to as a paradigm shift - a shift in our thinking as sweeping as, for example, Einstein's contributions were for science.

Our perspective is limited by our individual experience and shaped by our language. We tend to try and maintain the status quo. Instead of finding ways to come to grips with rapidly changing conditions and ideas in the world around us, we tend to ignore, reject or suppress the evidence and information before us unless it reinforces our own beliefs. If we are to break from this pattern and overcome our personal and cultural history, we must recognize the nature and direction of change and creatively find ways to guide and grow with the transformations. In order to do this we must develop a paradigm for transformational change instead of being content to live with the outdated "pendulum swing" paradigm of change, which has dominated Western educational thinking since the time of Plato.

Based upon such dichotomies as "mind and matter," "body and spirit," "freeman and slave," the "pendulum swing" paradigm polarized educational thinking into sets of either/or terms, as, for example, students and faculty,

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subjects and methods, traditional and progressive. These closed sets are such a highly ingrained part of our culture that we overlook how they limit us to linear thinking. It is the futility of trying to use these closed system constructs for future planning which has forced us to question their validity and to look for a more appropriate model.

The model or paradigm being offered here, as a break from the past, depicts change as sequential, emergent and transformational. The stages reflect the patterns in the agricultural, industrial and technological eras. The stages have ranged over periods of 2,500, 250, and approximately 25 years.

The transformational model (McBeath 1969, Davies 1972) emerged in the 60's as a result of looking into the nature and direction of change in society and education. After examining technology and science as the major agents for change in our society, it became evident that a series of changes or developments in each area is observable. The three step format depicts these changes in the agricultural, industrial and technological areas.

An examination of the progressive changes in the technologies of transportation, power and industry shows this pattern of development:

Stage I	Stage II	Stage III
Wheel	Motor	Jet propulsion
Manpower	Machine power	Computer controls
Cottage industry	Mechanization	Automation

Within the field of science a parallel progression can be seen in the triads:

Stage I	Stage II	Stage III
Certainties	Confusion	Probabilities
Linear sets	Rationalized structures	Emerging patterns
Closed system	Open system	Organic systems

The addition of further triads shown in the model reveals relationships and a structure which warrants the categorization of stages. The model shows that change is sequential and that the type of emergence from one stage to another

is transformational.

One of the most significant implications revealed by an examination of growth in technology and science is that the scientific principles which are developed in an era enable society to create with and control the technology of that era. Attempts to use the principles of an earlier period with the new technology result in a systems mismatch and pollution. The closed system, two-staged, polarized approach is inadequate for problems of the future in both society and education.

After describing the patterns of change that have been taking place in technology and science, it was recognized that a similar structure could be identified for education. The three stage model depicting transformational change in education is outlined under the headings of principles, practices and outcomes. As the model shows (Figure 1), the direction of change is from autocratic and permissive toward democratic control; from doing things "to" or "for" to doing things "with" students; from logical thinking and rote memorization, through logical thinking and free expression, to a balance of logical and creative thinking. In our field the staged progression is from teaching aids, to audiovisual techniques, to instructional technology.

As educators we characteristically gravitate to one stage or another depending upon our experience, our attitudes, and our professional expectations. Whatever our focus, there can be movement in either direction - toward adventure and risk in the future, or in reverse toward the psychological security of the past. Stage I incorporates the traditions of the past and reinforces the dependency syndrome in students. In Stage II, concerns are with the processes of the present and reinforcement of independence in students, while in Stage III the new focus is upon outcomes in the future and interdependence.

From discussions with over a hundred groups in English speaking countries, there is general consensus that probably 70 percent of us are at the Stage I level, about 25 percent at Stage II, and possibly five percent at Stage III with respect to our beliefs and educational practices.

A Model Depicting Change as Sequential, Emergent and Transformational

Stage I	Stage II	Stage III
Developments in Technology		
wheel	motor	jet propulsion
manpower	machine power	computer controls
cottage industry	mechanization	automation
structures and functions	functions in structures	structures for functions
units	networks	constellations
explore	exploit	conserve
Developments in Science		
certainties	confusion	probabilities
absolutes	relative absolutes	relatives
metaphor	toward models	functional models
linear sets	rationalized structures	emerging patterns
closed system	open system	organic systems
static	dynamic (in flux)	dynamic (evolving)
Developments in Education		
Principles		
active mind	reactive mind	transactive mind
unity (dualism)	unity (monism)	pluralism
autocratic	laissez-faire	democratic
Practices		
teacher dominated	permissive	inquiry centered
do things to	do things for	do things with
subject emphasis	method emphasis	interdisciplinary emphasis
product oriented	process oriented	performance oriented
extrinsic manipulation	random reinforcement	meaningful involvement
standards grouping	age grouping	readiness grouping
class teaching	group teaching	self paced learning
fixed stimulus	multiple stimuli	organized stimuli
limited access	random access	systematic access
limited resources	multiple resources	instructional systems
teaching aids	audiovisual techniques	instructional technology
Outcomes		
fixed response	varied response	response mastery
convergent thinking and rote memory	convergent thinking plus free expression	convergent and divergent thinking
competitive	cooperative	adventure
inner directed	other directed	self actualizing

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Probably more important than trying to use these numbers in a definitive way is to recognize that within any area or country teachers are at different levels of readiness and behavior in terms of their teaching practices, their objectives, and the ways they relate to students. Teachers will also differ in how they relate to authority, the community, to rules and regulations. They will each have different expectations, different methods for communicating, and a different sense of satisfaction from their professional activities.

The model helps us to recognize these differences and see the patterns in which they appear. It shows how the patterns are interconnected and that there is a direction to changes in education. It also shows that changes in human behavior and belief systems take place slowly, but that through long range planning we can each contribute and have some impact on our systems of education.

If we wish to contribute toward being effective crew members on Spaceship Earth, then we have a professional challenge which this model of transformational change can help us come to grips with in a pragmatic way.

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